

CLAIMS

What is claimed is:

- 1 1. A method comprising:
2 receiving code;
3 executing the code;
4 generating data that indicates performance of the executed code; and
5 causing the executed code to be modified based, at least in part, on the data.
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1 2. The method of claim 1, wherein the code comprises intermediate code.
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1 3. The method of claim 2, wherein executing the code comprises simulating
2 execution of the intermediate code.
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1 4. The method of claim 2, wherein generating the data regarding the
2 performance of the executed code comprises generating a performance profile.
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1 5. The method of claim 4, wherein causing the executed code to be modified
2 based, at least in part, on the data comprises annotating the intermediate code based, at
3 least in part, on performance profile data.
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1 6. The method of claim 5, wherein annotating the intermediate code
2 comprises concatenating data structures that include the performance profile data to
3 intermediate code to embed the performance profile data into the intermediate code.

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1 7. The method of claim 5, wherein annotating the intermediate code
2 comprises:
3 generating a file that includes the performance profile data; and
4 mapping the performance profile data to corresponding portions of intermediate
5 code.

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1 8. The method of claim 5, further comprising providing the annotated
2 intermediate code to a compiler, wherein the compiler transforms the annotated
3 intermediate code into machine code.

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1 9. The method of claim 5, wherein the performance profile data comprises
2 one or more of branch statistics, loop statistics and function invocation statistics.

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1 10. The method of claim 8, wherein the machine code executes faster than the
2 intermediate code.

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1 11. The method of claim 1, wherein the code comprises machine code.

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1 12. The method of claim 11, wherein the executing the code comprises
2 simulating execution of the machine code.

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1 13. The method of claim 11, wherein generating the data regarding the
2 performance of the executed code comprises generating a data file.

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1 14. The method of claim 13, wherein causing the executed code to be
2 modified based, at least in part, on the data comprises providing the data file to a
3 compiler, wherein the compiler transforms the source code into modified machine code
4 based, at least in part, on the data file.

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1 15. The method of claim 14, wherein the data comprises one or more of
2 branch statistics, loop statistics and function invocation statistics.

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1 16. The method of claim 1, further comprising:
2 receiving external execution input; and
3 using the external execution input to execute the code.

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1 17. The method of claim 1, wherein the data comprises one or more of plain-
2 text format, binary representations, database maps, and character delimited proprietary
3 format.

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1 18. A method comprising:
2 transforming source code into intermediate code;
3 providing the intermediate code to a profiler;
4 receiving from the profiler annotated intermediate code; and
5 transforming the annotated intermediate code into machine code.

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1 19. The method of claim 18, wherein the annotated intermediate code is
2 annotated to include one or more of branch statistics, loop statistics and function
3 invocation statistics.

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1 20. The method of claim 18, wherein providing the intermediate code to a
2 profiler comprises providing the intermediate code to a virtual machine.

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1 21. A method comprising:
2 transforming source code into machine code;
3 receiving a data file generated by a profiler, wherein the data file indicates a
4 performance of the machine code as executed by the profiler; and
5 transforming the source code into modified machine code based, at least in part,
6 on the data file.

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1 22. The method of claim 21, further comprising providing the machine code to
2 the profiler.

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1 23. The method of claim 22, wherein providing the machine code to the
2 profiler comprises providing the machine code to a virtual machine.

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1 24. The method of claim 22, wherein providing the machine code to the
2 profiler comprises providing the machine code to a probed processor.

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1 25. The method of claim 21, wherein the data file includes one or more of
2 branch statistics, loop statistics and function invocation statistics.

1 26. The method of claim 21, wherein the data file includes an identifier that
2 associates an executed instruction with generated data.

1 27. The method of claim 21, further comprising:
2 determining whether to modify the modified machine code; and
3 providing the modified machine code to the profiler, if the modified machine code
4 is to be further modified.

1 28. The method of claim 27, wherein determining whether to modify the
2 modified machine code comprises determining whether a predetermined performance
3 gain has been achieved.

1 29. The method of claim 28, wherein determining whether the predetermined
2 performance gain has been achieved comprises determining whether the modified
3 machine code executes faster than the machine code.

1 30. The method of claim 28, wherein determining whether to modify the
2 modified machine code comprises determining whether a cost of modifying the modified
3 machine code exceeds a performance gain to be achieved by the modifying.

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1 31. The method of claim 21, wherein receiving the data file comprises
2 receiving the data file via one of a data storage device, an alphanumeric input device, a
3 network interface, a shared data storage location, and a direct real-time connection.

1 32. An apparatus comprising:
2 a front-end code generator to transform source code into intermediate code and
3 provide the intermediate code to a profiler; and
4 the profiler, coupled with the front-end code generator, to receive external
5 execution input, execute the intermediate code using the external execution input,
6 generate a performance profile regarding the performance of the intermediate code, and
7 annotate the intermediate code based, at least in part, on the performance profile, to
8 generate annotated intermediate code;
9 a back-end code generator, coupled with the profiler, to receive the annotated
10 intermediate code, and transform the annotated intermediate code into machine code.

1 33. The apparatus of claim 32, wherein the performance profile includes one
2 or more of branch statistics, loop statistics and function invocation statistics.

1 34. The apparatus of claim 32, wherein the profiler comprises a virtual
2 machine.

1 35. An apparatus comprising:

2 a front-end code generator to receive source code and a data file from a profiler,
3 and transform the source code into intermediate code based, at least in part, on the data
4 file; and

5 a back-end code generator, coupled with the front-end code generator, to receive
6 the intermediate code, transform the intermediate code into machine code, and determine
7 whether to provide the machine code to the profiler for generation of a second data file.

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1 36. The apparatus of claim 35, further comprising the profiler, coupled with
2 the front-end code generator and the back-end code generator, to receive original
3 machine code from the back-end code generator, receive external execution input,
4 execute the original machine code using the external execution input, generate a data file
5 regarding the performance of the original machine code, and provide the data file to the
6 front-end code generator.

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1 37. The apparatus of claim 36, wherein the profiler receives the machine code
2 from the back-end code generator, executes the machine code, and generates the second
3 data file regarding the performance of the machine code.

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1 38. The apparatus of claim 35, wherein the data file includes one or more of
2 branch statistics, loop statistics and function invocation statistics.

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1 39. The apparatus of claim 35, wherein the profiler comprises a virtual
2 machine.

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1 40. The apparatus of claim 35, wherein the profiler comprises a probed
2 hardware.

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1 41. An article of manufacture comprising:
2 a machine-accessible medium including thereon sequences of instructions that,
3 when executed, cause an electronic system to:
4 receive code;
5 execute the code;
6 generate data that indicates performance of the executed code; and
7 cause the executed code to be modified based, at least in part, on the data.

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1 42. The article of manufacture of claim 41, wherein the code comprises
2 intermediate code.

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1 43. The article of manufacture of claim 42, wherein the sequences of
2 instructions that, when executed, cause the electronic system to generate the data
3 regarding the performance of the executed code comprise sequences of instructions that,
4 when executed, cause the electronic system to generate a performance profile.

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1 44. The article of manufacture of claim 43, wherein the sequences of
2 instructions that, when executed, cause the electronic system to cause the executed code
3 to be modified based, at least in part, on the data comprise sequences of instructions that,

4 when executed, cause the electronic system to annotate the intermediate code based, at
5 least in part, on performance profile data.

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1 45. The article of manufacture of claim 44, wherein the machine-accessible
2 medium further comprises sequences of instructions that, when executed, cause the
3 electronic system to provide the annotated intermediate code to a compiler, wherein the
4 compiler transforms the annotated intermediate code into machine code.

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1 46. An article of manufacture comprising:
2 a machine-accessible medium including thereon sequences of instructions that,
3 when executed, cause an electronic system to:
4 transform source code into machine code;
5 receive a data file generated by a profiler, wherein the data file indicates a
6 performance of the machine code as executed by the profiler; and
7 transform the source code into modified machine code based, at least in part, on
8 the data file.

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1 47. The article of manufacture of claim 46, wherein the machine-accessible
2 medium further comprises sequences of instructions that, when executed, cause the
3 electronic system to provide the machine code to the profiler.

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1 48. The article of manufacture of claim 46, wherein the machine-accessible
2 medium further comprises sequences of instructions that, when executed, cause the
3 electronic system to:

4 determine whether to modify the modified machine code; and
5 provide the modified machine code to the profiler, if the modified machine code
6 is to be further modified.

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1 49. The article of manufacture of claim 46, wherein receiving the data file
2 comprises receiving the data file via one of a data storage device, an alphanumeric input
3 device, a network interface, a shared data storage location, and a direct real-time
4 connection.

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1 50. A system comprising:
2 a processor;
3 a dynamic random access memory coupled with the processor; and
4 an article of manufacture comprising a machine-accessible medium including
5 thereon sequences of instructions that, when executed, cause an electronic system to:
6 receive code;
7 execute the code;
8 generate data that indicates performance of the executed code; and
9 cause the executed code to be modified based, at least in part, on the data.

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1 51. The system of claim 50, wherein the code comprises machine code.

1 52. The system of claim 50, wherein the code comprises intermediate code.

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1 53. The system of claim 50, wherein the machine-accessible medium further
2 comprises sequences of instructions that, when executed, cause the electronic system to:
3 receive external execution input; and
4 use the external execution input to execute the code.

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